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HYDATID DISEASE IN WALES*

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In April, 1937, the attention of the Welsh Board of Health was drawn by Mr. Lambert Rogers, M.S., F.R.C.S., Professor of Surgery at the Welsh National School of Medicine, to the relatively high incidence of hydatid disease in South Wales. An enquiry by the Department into the records of every hospital in Wales during the period 1927-1936 showed that during this period 144 cases of hydatid disease were admitted to hospital. The hospitals in Liverpool and Chester and the teaching hospitals in London, also, supplied information concerning the few cases admitted from Wales.

The majority of cases came from the industrial districts of South Wales and comparatively few from the agricultural and sheep-raising areas. Eighty-nine cases, *i.e.* 62 per cent., occurred in the industrial counties of Glamorgan and Monmouth and of these 46 cases lived in the four county boroughs. There were four cases in the industrial part of Breconshire bordering on Glamorgan, 11 in the County of Flint, five in the industrial part of the county and six in the seaside resort of Rhyl. In Denbighshire the five recorded cases were from the industrial area. There were 64 males and 80 females in the series, and the ages of patients ranged from 2½ years to 77 years.

Dew, in opening a discussion on the subject of hydatid disease at the British Medical Association Conference in Melbourne in 1935, said that it was now well established that in the majority of cases infestation takes place in childhood and that, owing to very slow growth, the cyst does not make itself felt until adult life is reached. Whether growth of the cyst is as slow as is commonly supposed is a subject for consideration. We know that the disease is found quite commonly in food animals and that animals are relatively young at the time of slaughter. Several veterinary inspectors said that they had seen cysts in lambs at the age of about one year but none could be sure that they had seen cysts in calves, which are killed at a very much younger age. In one slaughter house where records were kept no cysts were found in 12,000 calves.

There seems to be no reason for supposing that a cyst takes longer to develop in a human being than in an animal unless there are optimum conditions for the growth of these cysts and that such conditions occur in animals.

The early appearance of signs of the disease in human beings are sometimes dependent on the site of the cyst. A cyst developing superficially is likely to be observed early, and a cyst which interferes with the function of a vital part of the body, such as the central nervous system, is likely to produce symptoms at an early stage. In the majority of cases in young people the cyst was in the liver and the swelling alone drew attention to the disease before any symptoms appeared. One of our cases, a child of two years, was taken to hospital because of an abdominal swelling which at operation six months later proved to be due to multiple hydatid cysts of the liver. Cysts were also found in the right lung in this child. A child of four years was found by the school medical officer to have a swelling in the right abdomen and at operation hydatid cyst of the liver was found. Another child of four years also operated on for a swelling in the upper abdomen was found to have a cyst in the liver the size of an orange.

Twenty-eight of our cases were under 14 years and 11 of these under 10 years.

Among the 144 cases there were 30 deaths. In 16 of the deaths the site of disease was the liver, in seven the lung and in two cases there were multiple cysts in the liver and lungs. In the remaining five cases, the brain, spine, spleen, abdomen and abdominal wall respectively were affected.

It is impossible to assess the amount of infestation among human beings in Wales because *post-mortem* examinations are not done as a routine in hospitals. We were told, however, that when such examinations are carried out it is by no means uncommon to find hydatid cysts in the organs, although there were apparently no symptoms present during life.

The number of cases from 1927-1936 of which we obtained a record was 144 and there were 30 deaths among this number. We know, however, that from 1931-1937 there were 39 deaths in Wales due to hydatid disease. It is probable that many cases remain undiagnosed until a catastrophe such as rupture of a pulmonary cyst followed by death, occurs. Several cases of this type appear in our records. Thirteen cases had been diagnosed as tuberculous and referred to a tuberculosis officer. One patient had been diagnosed as suffering from a sarcoma of the femur, and the leg had been amputated.

Source of Infection

It was not possible to discover the source of infection in these cases as some time had elapsed between the occurrence of the cases and the beginning of our enquiry.

It is unfortunate that the source was not investigated at the time of operation. In practically no case had any attention been paid to the public health aspect of the disease. In one case where the patient was in

*Appendix D to the Annual Report of the Chief Medical Officer of the Ministry of Health for the year 1938. Reproduced by permission of the author, of Dr. McNalty and of the Controller of H.M. Stationery Office.

hospital after this enquiry started, investigation by the Department proved the source of infection to be a pet pekinese dog. The patient lived on a farm where other dogs were kept, but the infected dog was the only animal allowed indoors and handled by the patient. In only 77 cases was a definite history of a direct association with dogs given.

In Merthyr Tydfil three cases in one household were operated on for hydatid disease between January and June, 1934. Dogs, mainly greyhounds, had always been kept by the family and lived indoors in a small house where contact with the family was close. The dogs were treated for worms frequently but no precautions were taken for dealing with the excreta. In nine cases the illness had been attributed to eating watercress and fresh garden produce.

In the Swansea area it was stated that this disease was associated in the lay mind with the eating of watercress gathered locally. For many years an average of three cases per annum have been admitted to the Swansea hospital and since 1927 the Casoni skin test has been carried out as a routine at this hospital on patients in whom there is any suspicion of hydatid disease.

In one case infection was said to be due to a pet cat, but it was not discovered whether *Echinococcus granulosus* occurred in the cat. Infestation of cats is known to occur, but it is said to be relatively light; and the cat has been classified as an abnormal host of *Echinococcus granulosus*. In practically every case which was followed up to the home there was a garden attached to the house, where green vegetables and salad materials were grown. The dog roamed freely in the garden and there was every opportunity for green stuff to be infected. Although it is probable that infection in the main occurs directly from dogs we need more information about the part played by infection of foodstuffs by dogs and flies.

Breed of Dog.—As a matter of interest the breed of dog kept by the patient was enquired into. In only two cases was it a sheep dog, a fact to be expected since the majority of cases occurred in industrial areas.

Greyhounds, terriers and spaniels were the commonest breeds kept by the patients, but Pomeranians, Airedales, Alsatians, Pekinese and mongrels were included. It was not possible to obtain much information from veterinary surgeons as to whether there is an increased incidence of *Echinococcus* infection in dogs. It is generally agreed, however, that there has been a change in the diet of dogs in recent years and that more meat, particularly liver, is given now than formerly. The possibility that meat which has been rejected by butchers is given to dogs by the poorer people cannot be overlooked. The possibility of infestation of cats by such meat must also be borne in mind.

Occupation.—Twenty-eight of the patients were school children or below school age. Nine of the male patients worked on a farm, three female patients were domestic servants on a farm, and all were in close association with dogs. Four patients were greengrocers, one a gardener, one a miner, one a roadman, one a quarryman, one a solicitor and one worked in a stable. Two women were domestic servants and both were in contact with dogs. Twenty were married women. Two women were married to dog breeders and helped in the kennels. The majority of cases occurred among the poor classes where opportunities for strict personal hygiene were not easily available.

An attempt was made to discover the extent of infestation by *Echinococcus granulosus* among animals used for food and to this end a large number of slaughter-houses were visited. Arrangements were made for records to be kept over a short period of the number of animals infested. In four slaughter-houses the following total figures were obtained :—

		No. affected.	Per cent.
Cattle	1,715	108	6·3
Calves	3,222	Nil	Nil
Sheep and lambs	23,165	780	3·36
Pigs	7,251	16	0·22

These figures do not give the actual frequency of echinococcal cysts in animals but include only those cases in which the organs were not marketable on account of extensive invasion. In most of the slaughter-houses visited I saw some infected livers and lungs.

In Wales there are 30 public abattoirs and 915 slaughter-houses either registered or licensed. In most areas killing in all slaughter-houses is done on the same day in the week. With this multiplicity of slaughter-houses effective supervision of meat is impossible in many areas.

Disposal of unfit meat was far from satisfactory in many areas. In one large town diseased offal was carted to a tip and buried. At this tip I was able to dislodge a liver infected with hydatid quite easily with my foot as it was very near the surface. Dogs were present while tipping was in progress. In another part of the town offal was bought by a market gardener for manure. The offal was dumped in the garden and covered with garden refuse. Dogs had easy access to the garden and in one corner there was a large pig sty. In this town 12 cases of hydatid disease had been diagnosed and admitted to hospital and one patient lived in a house adjoining this garden.

In another area I saw infected offal thrown over the wall of a slaughter-house on to some allotments where it was spread out for manure. In another area the inspector stated that until recently infested offal had been sold to the local hunt as food for the hounds. In this district several cases had occurred.

In most areas by-laws exist which contain a clause prohibiting dogs from slaughter-house premises, but this by-law is not strictly enforced. The idea was prevalent that it was permissible for the dogs accompanying sheep and cattle to the slaughter-house to remain. In some of the county areas occasional slaughtering on the farms still goes on. Obviously in many areas slaughter-houses constitute a large reservoir from which dogs are continuously infested and the opportunities for human infection are thereby enormously increased.

It is evident that hydatid disease in human beings is not uncommon in Wales. The majority of cases lived in the industrial areas. The reason for this distribution of cases is speculative and it must be borne in mind that in Wales the greater part of the population lives in the industrial counties of South Wales. There happens, however, to exist in these areas a variety of circumstances which tend to facilitate the spread of an infestation of this type. It is probable that the increasing pursuit of dog breeding is partly responsible. There has been in recent years an active interest taken in dog racing, particularly in the valleys of South Wales. Apart from racing on licensed tracks, in which case greyhounds are boarded in kennels and are trained on the tracks, there is also a good deal of racing on unofficial local tracks and in these cases the dogs

are trained locally and usually housed in the homes of their owners. These are frequently small and poor homes where contact with the family is close. Breeding of dogs for show purposes and for other local sporting events is also very common in all places where unemployment is high. It is usual for the dogs to live in the homes in close contact with the family.

The question of whether there has been an actual increase in the number of dogs in recent years was gone into, but statistics show that there has actually been some decrease in the number of licences granted. There still remains, however, a considerable number of stray dogs and unlicensed dogs.

In addition to the possibility of infestation of human beings primarily from dogs, the possibility of infestation through raw greenstuffs has also to be considered. There is also the possibility of ripe ova being conveyed to foodstuffs by means of flies. In recent years there has been an increase in the number of allotments and the cultivation of vegetables and greenstuffs. The allotments are usually unfenced and there is nothing to prevent the fouling of garden produce by dogs. On several occasions it was found that diseased offal was used as manure, particularly where gardening was done on a large scale. Precautions were not taken to bury the material as soon as it was spread on the ground.

It has been shown in animals that vitamin deficiency lowers resistance to helminthic infections (Hiraishi, 1936; Kordsumi, 1927, and others). There is every possibility that both the intermediate and definitive hosts suffered from such a deficiency in these distressed areas.

The increase in small holdings in the industrial counties in the past few years may have been an additional source of infection. In these small holdings generally a few sheep and cows are kept and green foodstuffs are grown. If infestation of a dog occurs there is a possibility of infection being concentrated in a small area and spread to the animals by infected pasture and to human beings *via* fresh garden produce.

The cases discussed are those which actually came to operation. We have no knowledge of the incidence of the disease and the amount of sickness due to it. Many practitioners stated that the disease was by no means rare and never had been rare, and some of the older practitioners could recall cases in their practices. In Monmouthshire one doctor described six cases on which he had operated during the past 20 years. It was generally agreed that the disease was becoming more common.

NATIONAL CAMPAIGN FOR SILAGE

The recent announcement that the Ministry of Agriculture has accepted the offer of Imperial Chemical Industries to assist in a national campaign for silage means that an additional force of grassland specialists will be at the disposal of the Ministry. Before the aftermath of hay is ready for cutting for silage-making a corps of several hundred silage experts will be available to give demonstrations and personal instruction to farmers in co-operation with the County committees. The goal of the campaign is a total of 1,000,000 tons of silage and 1,000 demonstrations by mid-September.

Farmers interested in silage-making are warned to lose no time in making inquiries locally with regard to the provision of silos, and secondly to treat the grass immediately the hay is up with nitrogenous fertilisers so that a strong growth of aftermath is produced. Booklets, leaflets, and instruction cards are being prepared and will be available through county committees and agricultural merchants.

ANNOTATION

Hydatid Disease

Of the many helminth parasites which infest humans, probably none is more serious than the larval stage of *Echinococcus granulosus*, which is generally referred to as "hydatid" or "hydatid cyst." It has been stated that echinococcosis or hydatid disease was clinically well known to the ancient writers on medicine, Hippocrates (460-357 B.C.), Aretaeus (A.D. 9-79 and Galen (A.D. 130-200) having referred specifically to the disease, although the term "hydatid" was used by several ancient and medieval physicians for any tumour or swelling of a cystic character. It was not until the seventeenth century that the animal nature of the true hydatid cyst was suspected by scientists. Later, Goeze, in 1782, recognised the scolices developing within the cyst as those of a taenioid cestode and was able to differentiate the hydatid from the cysticercus and coenurus types of larvae. Towards the middle of the nineteenth century several investigators determined, by experiment, the relationship between the adult tapeworm in the dog and the larval or hydatid stage in man, cattle, sheep and other animals.

Although other species of *Echinococcus* have been described, *Echinococcus granulosus* (Batsch, 1786) is the common member of the genus and is the only form known to occur both in man and domesticated animals. It has been recognised, for many years, as one of the most important tapeworms of carnivores, both from the human and the economic points of view. It is generally described as cosmopolitan in its distribution, but the statement needs qualification and its known distribution is roughly that of the sheep- and cattle-raising regions of the world. It occurs throughout Europe, being relatively common in Iceland, Germany and Bulgaria; infection in man is general in Central and Northern Europe, but the incidence is not heavy. It is rare in the United States of America but very common in parts of South America particularly the Argentine, Uruguay and Paraguay. It is rare in India and the Far East but relatively common in North Africa. Australia is one of the classic homes of the disease where, as Ross pointed out, in 1926, hydatid cysts were found in over 30 per cent. of sheep and cattle in New South Wales; Hamilton Fairley and Penrose, in 1928, showed an incidence of over 20 per cent. in sheep and cattle in Victoria. In New Zealand, Barnett has recorded incidences of 43 per cent. and 46 per cent. in sheep and cattle respectively.

The most important final host of the parasite is the dog. The fox, wolf, jackal, coyote, dingo and other Canidae elsewhere have also been found naturally infected; Felidae are infected only with difficulty and it is doubtful whether the cat is ever naturally infected with mature worms. Apart from the dog, the other final hosts are minor factors in the propagation of the disease in man but they are of some importance in relation to the incidence of hydatid disease in sheep and other domesticated animals.

The intermediate hosts include a very large number of mammals. The optimum host appears to be the sheep in which only about 8 per cent. of the hydatid cysts are sterile. Pigs (about 20 per cent. of cysts sterile), cattle (about 90 per cent. of cysts sterile), horses, camels and goats are also infected among the domesticated mammals. Man is also frequently infected, particularly in pastoral countries, but he is

generally considered as an accidental host since the parasite is never likely to complete its life-cycle in humans.

Readers are doubtless aware of the life history of the parasite and how the embryos, after hatching from the eggs in the intestine of the intermediate host, migrate to the blood stream which carries them to various organs. An enormous literature has accumulated round the subject of hydatid disease from the point of view of both human and veterinary medicine. Within the past quarter of a century much important work has been carried out on the biology and life history of the parasite and the elucidation of most of the hydatid stage of the life-cycle of *Echinococcus granulosus* has been the result of researches by Professor Dévé, of Rouen, and Dr. Harold Dew, of Sydney. The varieties of cysts encountered in different hosts have been classified as (1) simple unilocular cysts; (*a*) sterile, (*b*) fertile; (2) multilocular cysts; (3) multicystic or pseudo-alveolar type. It appears that certain types are particularly characteristic of certain hosts. Thus the fertile multilocular cyst is most frequently found in ovines and the unilocular sterile cyst in bovines. Multicystic varieties are also found in the livers of cattle and less commonly in sheep, but they are rare in pigs and man. In man, another variety is encountered and is referred to as the alveolar type of hydatid; there has been much discussion as to the origin of this type. The general trend of modern opinion is towards the assumption that all the pathological types represent the end results of different host reactions to the one parasite, *Echinococcus granulosus*, and that the type of cyst produced in any particular host appears to be determined by the species immunity and is dependent on the particular state of biological equilibrium established between host and parasite. Abnormal disturbances of this equilibrium sometimes occur and disturb the balance with the subsequent production of atypical pathological forms. Thus practically any pathological type may exceptionally be observed in the one species of host, as is well illustrated in man in whom every variety of cyst is known to occur. Much the same may be said of daughter and granddaughter cyst formation, and in all intermediate hosts exogenous as well as endogenous forms of budding occur, the former being particularly characteristic of the short-lived hosts such as the herbivora, the latter of the longer lived such as man.

The great importance of the parasite is its relation to human health and the effects of the cystic stage in causing hydatid disease of man. The pathogenic importance of *Echinococcus* in sheep and cattle generally is very slight and even massive infections are usually only detected at the abattoirs after slaughter. In the past, as Clunies Ross and Gordon and others point out, emphasis has been placed on the method of infection of man rather than the dog in relation to control measures for the eradication of hydatid disease. It is essential to realise that as long as dogs remain infected with the adult tapeworm, infection of man and domesticated animals is bound to occur, whatever prophylactic measures may be recommended for the protection of the former. Man may become infected in a variety of ways. Contagion may occur through contact with dogs, especially by acquiring dried eggs on the hands from a dog's coat contaminated with dried faeces. The risk incurred by adults is not as great as that by young children who have little or no knowledge of hygiene. In Iceland, it has been shown by Einarsson, that where ewes are herded together and their fleece becomes soiled with sheep-dog faeces, eggs are mechanically transferred to the hands, particularly of women, who milk and shear the animals. This risk of infection through handling sheep is no doubt less in other countries but still remains a possibility. In the past the danger of water-borne infection has been stressed as the principal source of infection of man, but Ross, who investigated this problem in Australia, contests the importance of water and considers infection by this source to be negligible. It is pointed out that the eggs of the parasite, like most other worm eggs, do not float on the surface of drinking water in the state in which they are usually passed in the faeces but sink to the bottom of any water into which they fall. Faecal contamination of foodstuffs, particularly vegetables, is probably a common source of infection; foodstuffs may also be contaminated by flies which mechanically carry tapeworm eggs from dog faeces. It is generally recommended that every precaution should be taken to ensure that raw vegetables are thoroughly washed before use. Dévé believes that washing one's hands before cooking and eating would materially diminish infection. Such advice might well be taken by all who come in contact with dogs for it would do much to reduce the incidence of hydatid disease in humans.

The great bulk of infection of dogs with the adult tapeworm results from eating cysts in raw sheep offal, sheep being of primary importance in relation to the disease. Cattle are less important since the majority of the cysts found in them are unfertile and, even if eaten by dogs, infection seldom results. Rabbits are of negligible importance as a source of infective material since they are rarely found naturally infected. Those who have read Dr. Howell's article dealing with hydatid disease in Wales and which appears in this issue of *The Veterinary Record*, will have found much in it which interests and probably shocks them. Dr. Howell makes it abundantly clear how easy it is for the dog to acquire infection and exposes the ineffective enforcement of regulations for the exclusion of dogs from abattoirs. Perhaps no better example of the vicious cycle could be found than in the author's description of how infested offal, presumably raw, had been sold, until recently, to a local hunt as food for the hounds. But Dr. Howell is not alone in finding such malpractices. Ross found in New South Wales that in certain country abattoirs and on farms it was common practice to throw infected viscera to dogs. Doubtless, others in different localities could say the same. It is the slaughter-houses which undoubtedly constitute the weak link in the chain of present-day prophylaxis and until this has been strengthened and the practices in vogue in abattoirs, large and small alike, radically changed no material decrease in the incidence of hydatid disease can reasonably be anticipated. Dogs should be rigorously excluded from all abattoirs and all diseased material should be detected and condemned. It would also seem, from a perusal of Dr. Howell's paper, that more than this is necessary. To counteract the spread of infection resulting from such activities as dog breeding and dog racing and the use of diseased offal as manure some sort of educative propaganda programme in schools, country centres and abattoirs emphasising the dangers to children and adults alike of intimate contact with dogs as well as their liability to contaminate uncooked foods, would

appear to be very necessary. It has been said that in countries where rabies is endemic, close association with dogs is discouraged by the educated and enlightened elements in the community. There appears to be no adequate reason why a similar attitude of mind should not develop in the population of this, and indeed of other countries also, if knowledge of the life history of *Echinococcus* is adequately presented in popular form to the public.

J. N. O.

Trichinosis in Pembrokeshire

In December of last year we received information that an outbreak of Trichinosis was occurring in Haverfordwest (Pembrokeshire) and neighbourhood, that several persons were in hospital in the town under treatment for this condition and that many more in the area were ill; also that Mr. A. Nisbet, a member of our profession, was one of the victims. Recent enquiry of the Secretary of the Welsh Board of Health has elicited the information that the reports of the Medical Officers of the Department on their investigations into the outbreak and its origin are not yet complete.

Mr. Nisbet, in the meantime, has furnished us with the following account of his experiences. He believes that the disease was probably derived from infested meat but, as far as is known, nothing has as yet been proved concerning this point. Mr. Nisbet was fortunate in that he apparently developed a comparatively light infection, from which he has made a good recovery. He writes: "There were altogether about 15 cases in and around Haverfordwest. We were all ill at the same time and had the same symptoms. I believe that most of those concerned consumed pork from the same shop and the source of the infection, in my opinion, was a meal of pork sausages consumed 10 to 14 days before the onset of symptoms.

"In my own case the first symptom observed was oedema of the eyelids and the upper part of the face, which oedema became very marked on the fourth day. This was accompanied by a persistent headache which lasted continuously for four or five days. Temperature was normal up to the third day when it rose to 103° F. and kept between 101° and 103° F. for about three weeks. Appetite was good throughout the attack except on the fourth day when slight sickness was felt. Muscular pains manifested themselves about the fifth day, affecting the muscles of the legs, arms, diaphragm and tongue. Blood smears showed a marked eosinophilia (55 per cent.) which did not finally disappear till about four months after the onset of symptoms.

"Diagnosis was not confirmed till about the tenth day. The only treatment administered was eye lotion and Trichlorophenyl emulsion internally.

"I was confined to bed for three weeks and in that time lost 12 lb. in weight. After getting up I suffered from attacks of colic which persisted for another two months.

"I do not think the source of infection has been traced."

Our original informant, writing from Carmarthenshire on December 11th, made the significant statement, relative to the area concerned in the above outbreak, "There is no meat inspection by a veterinary surgeon."

THE VETERINARY RECORD

July 6th, 1940.

THE CANADIAN INVITATION

IT has been truly said that adversity reveals one's real friends. The cablegram from the members of the Ontario Veterinary Association which we reproduce elsewhere in this issue exemplifies the very real feeling of friendship and the bonds which exist between the Mother Country and its Dominions. This kindly gesture from our Canadian confrères will long outlive the bitter recollections of the anxious times through which we are now passing.

Whether there be few or many in this country who feel able to avail themselves of this opportunity to send their children to the safety of Canada, it will indeed be a comfort to all to know that there are friendly homes waiting to welcome the evacuees.

When, soon after the outbreak of war, the National Veterinary Medical Association extended a welcome and hospitality to any veterinary surgeon who happened to be a member of the Canadian Expeditionary Force, it little thought that its offer would be answered in such full measure.

We feel sure that all our readers will join with us in expressing our deep appreciation of this message from overseas which should do much to alleviate the anxiety of a number of veterinarians in this country.

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DISEASED MEAT AND HUMAN INFECTION: A LESSON FROM SOUTH WALES

MANY cross-roads on our highways are obviously dangerous to the public, yet necessary precautionary measures are often postponed until serious accidents occur and public opinion compels the authorities to install roundabout islands, robot lights or other means to reduce the possibility of accidents at such points. Similarly, in public health, dangerous spots are often ignored until the number of accidents which occur becomes so large that the general public becomes interested, ventilates the problem and brings pressure to bear on the public health authorities to eliminate the danger spots. When dangers are apparent to authorities, it is wrong that they fail to act unless and until public opinion arouses them to action.

One of the responsibilities in the public health of this country which has been too long neglected is that of the protection of the consumer against some of the dangers of diseased meat, particularly in that branch of meat inspection in which diseases of animals are communicable to man. Scientific meat inspectors have long recognised that animals

play a large part in the dissemination of diseases in man.

As yet the general public in this country is not conscious of the importance of meat inspection in the prevention of such diseases. From time to time there are local scares concerning anthrax, trichinosis, etc. In 1937 the attention of the public health authorities in South Wales was aroused by the abnormally high percentage of cases of trichinosis and hydatid disease among patients admitted to hospitals. The main facts of the reports of the work of Dr. Nancy Howell, of the Welsh Board of Health, and Mr. Lambert Rogers, of the Welsh National School of Medicine, clearly show the urgent necessity for the initiation of measures to eliminate from the dietary of the people who may be exposed to the danger of consuming it, meat affected with parasitic diseases which may infect man.

England and Wales lag behind other countries in efficient meat inspection. We insist on other countries, which send meat to this country, establishing and maintaining efficient veterinary inspection staffs to examine and certify all meat sent to us, with the result that our imported beef and mutton are found free from disease, but, unfortunately, the same cannot be said for all of our home-killed meat which reaches the consumer.

No one who understands the good results to public health of veterinary meat inspection can be other than profoundly dissatisfied with the condition of much of the meat which reaches the consumer in South Wales. The high incidence of hydatid disease met with in the hospitals seems to indicate that there is inadequate control of hydatid disease in animals. The presence of these diseases in man indicates a lack of development of civilisation, and the department whose duty it is to erect the appropriate robot light and fails to do so, is incurring a grave responsibility. If the Ministry of Health appreciates the dangers, as seen by the Report, why should they delay in pressing the local authorities to institute adequate meat inspection and the destruction of all diseased meat?

The veterinary profession in this country was employed, in the early years of this century, in the eradication of glanders, a dread disease communicable from the horse to man. A case of this disease has not been seen in the country for some years. Similarly, veterinary measures have eliminated rabies, once so prevalent in England, while through the work of the veterinary surgeon, anthrax has been kept in check. For many years much money has been expended to reduce bovine tuberculosis infection in man, by means of sanatoria and the treatment of infected cases. It is only recently that the veterinary profession has been called upon directly to tackle the eradication from the root cause, the milking cow, and the fact that the number of herds freed from this disease is rapidly increasing indicates that the cause of the disease in man will, from year to year, diminish.

There are strong grounds for stating emphatically that, given the opportunity, the veterinary profession would rapidly eliminate such diseases as trichinosis and hydatid disease. If veterinary surgeons are placed in charge of meat inspection, conditions of meat dangerous to man will be recognised, and if the cysts are destroyed the life cycle of the parasite is broken. The majority of cases of trichinosis are caused by the consumption of infested pig meats. It behoves every Veterinary Officer in charge of meat inspection to carry out microscopic examinations of predilection sites of the parasites in all pig carcases derived from districts where the disease is prevalent and evidence at our disposal suggests that all South Wales might be included.

With regard to hydatid disease, a walk through a slaughterhouse often reveals pieces of lungs, livers and spleens lying about, all infested with echinococcus cysts. Dr. Howell mentions a case in South Wales where infested organs were carted to a tip and left exposed to animals. In another case the offal was dumped over a slaughterhouse wall on to an allotment. These slipshod methods of disposal of infested organs perpetuate the parasite. This most vulnerable point in the life cycle of *Echinococcus granulosus* can be struck at by thorough inspection and disposal of infested organs.

There is evidence that the system of meat inspection and disposal of diseased meat in South and West Wales is inadequate. Meat affected with such parasites as the trichina or the hydatid cyst is a serious menace not only to that locality but to public health generally.

RESTORATION OF HEAVY GRASSLAND

Mr. R. S. Hudson, Minister of Agriculture, speaking at Stratford-on-Avon at the inauguration of the Grassland Station, announced that the Ministry had taken over 600 acres of heavy clay land in Warwickshire. This step, together with the opening of the new station, he said, represented the serious endeavour of the Government to grapple with one of the biggest problems of British agriculture—the restoration on economic lines of the vast areas of run-down heavy grassland which at present made so small a contribution to our national food production or to the income of those who farmed it. Taking the country as a whole, the acreage of this sort of land ran into millions.

After paying a tribute to Sir George Stapledon for his work on the problem of heavy grassland, Mr. Hudson said there was one matter with which he was deeply concerned. We were facing a winter which might prove an exceedingly difficult one from the standpoint of maintenance of our dairy herds and other livestock. As a safeguard against the possibility of serious feeding stuff shortage, he wanted all farmers who could do so to lay in a store of silage which might prove an invaluable stay during the bleak winter period.

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Speaking at Carlisle Mr. Wilfred Roberts, M.P. for North Cumberland, said Britain's output of foodstuffs could be doubled—not all at once, but in a year or possibly two years. We could not afford to have badly-managed farms. He was confident that the rural community had a real contribution to make to the winning of the war and that it might be by increasing production whether for man or beast, because animal foodstuffs had to be imported.

CLINICAL COMMUNICATION

Some Observations on Bracken Poisoning

J. F. CRAIG and G. O. DAVIES

In the June, 1940, issue of the *Journal of the Ministry of Agriculture* appeared an article by W. G. R. Paterson on " Bracken Control." In this publication, a recommendation is made that if bracken is cut before it gets too strong and fibrous, it can be made into quite useful silage. It is also recommended that bracken should be used as litter for cattle.

Whilst the writers are unaware of any trouble arising from the use of bracken in silage, it is well-known that cattle grazing in the autumn on land rich in bracken will sometimes become affected with a serious condition which is spoken of as " bracken-poisoning." The circumstances leading to this condition are obscure, but it would appear that bracken is only sometimes toxic and that the poison is probably a phytotoxin.

As regards the use of bracken for litter there is little information available regarding the risk in its use. Stockman (1917) in his aticle on this subject stated that " some veterinary practitioners have reported that they have met with cases of poisoning in cattle bedded on dried bracken during the winter but in no case could they supply a satisfactory account of the symptoms and lesions."

In view of the importance of this subject at the present time, the writers feel that attention should be drawn to the following outbreak as it points to the fact that if conditions are such that animals consume bracken on which they are bedded, cases of bracken poisoning may arise.

The farmer on whose farm this outbreak occurred had been in the habit of rearing calves every year. They were pail-fed up to six weeks and after that were given milk and water, crushed linseed cake, flaked maize and bran. They were bedded down on bracken, straw and inferior hay.

The owner experienced his first losses in 1937, and five or six calves died out of ten. In October, 1938, losses again commenced amongst calves from three weeks to four months of age. When this enquiry was made three had died, one at six weeks of age, one at twelve weeks and one at four months. Another four months' calf had been killed and three more were ill. A live calf, six weeks old, brought in for examination was in very poor condition, its temperature was 100·8° F. and it was unable to stand. It was destroyed for *post-mortem* examination and revealed changes similar to those observed by the attending veterinary surgeon in previous cases.

The lungs were studded with firm, well-defined, dark-red areas like haemorrhages, lobular in extent and varying in size from that of a pea to that of a walnut. Petechial haemorrhages were present under the costal pleura, on the omentum and mesentery, under the serous capsule of the spleen, on the outer side of the wall of the gall-bladder and on the bicuspid and tricuspid heart valves.

The mucous membrane of the abomasum was dotted with haemorrhages and the intestinal mucous membrane, especially the first portion, was studded with thick, dark-red, round or oval, haemorrhagic patches about a ¼-inch to an inch in diameter. Some had yellowish, necrotic-looking centres. These lesions were also present in the large intestine. The alimentary contents were blood-stained and there was no difficulty in identifying bracken in the stomach contents.

A few petechiae were also evident on the mucous membrane of the bladder near the fundus.

Films and smears made at the time of autopsy were negative and media inoculated from the lungs, heart-blood, spleen, etc., remained sterile thus ruling out any possibility of haemorrhagic septicaemia, the only other condition which it resembled.

Without going into a long description it may be said that sections of the lesions in the lungs and intestines showed that the lesions were of the nature of haemorrhagic infarcts and ulcers. All the blood-vessels were enormously congested and distended and much of the tissue present consisted of blood and fibrin. In the intestine the mucous membrane involved in the lesions had undergone necrosis.

Admittedly the evidence which has been presented is purely circumstantial in nature, but the frequency with which such lesions are met with in cattle under the circumstances above noted behoves us to be somewhat guarded at present in any advice which we might be called upon to give regarding the use of bracken for either silage or litter.

References

Paterson. (1940.) *J. Min. Agric.* **47.** 55-62.
Stockman. (1917.) *J. comp. Path.* **30.** 311-316.

ABSTRACTS

[SURFEN C THERAPY IN TRYPANOSOMA CONGOLENSE INFECTION IN BOVINES AND OVINES. van Rensburg, S. W. J. (1938.) *Onderstepoort J.* **10.** 13-18 (2 tables).]

The only drugs that up to the present have been shown to be effective in the treatment of *T. congolense* infections are the antimony compounds. Prior to the advent of Antimosan reliance was placed on potassium antimony tartrate, but this drug had the disadvantage that it had to be administered by the intravenous route, a factor which militated against its use under ranching conditions when repeated injections were necessary. Accordingly this was supplanted by Antimosan, a complex of a trivalent antimony preparation with a pyrocatechin derivative, which could be injected either subcutaneously or intravenously. It is held that sterilisation of bovines infected with *T. congolense* can be obtained by the subcutaneous injection of 3 grammes Antimosan when given at four weekly intervals. But the necessity for so many repeated injections is a disadvantage and when Surfen C was made available with the claim that about 10 mg. per Kg. body weight given in a single dose either intramuscularly or subcutaneously was a certain sterilising dose in animals infected with *T. congolense*, it was hoped that a drug had been produced which would surpass the antimony preparations.

Surfen C (Hochst 6678) is a Bayer preparation and is stated to be an amino-quinoline derivative, easily soluble in water. It is claimed that " in calves the early treatment of a fresh congolense infection with even a single intramuscular injection of 5 mg. per

Kg. effects a cure. In experiments on sheep infected with *T. congolense* it was found that 10 mg. per Kg. Surfen C cures every stage of the infection both in early and late treatment." In Tanganyika Hornby concluded that "The result which may be expected to follow a single intramuscular injection of Surfen C is at least as good as the result to be expected from a course of five weekly injections of Antimosan or tartar emetic." Mettam (1934) used the drug in the treatment of 19 head of cattle infected with *T. congolense* in Uganda, with the result that one animal died, but the rest cleared up." He writes, "This drug is the best trypanocidal agent available for the treatment of cattle trypanosomes." Bennett in the Sudan tested the drug on 14 horses and states that it is certainly capable of curing nearly all, if not all, cases of *T. congolense* in horses. A single injection, however, frequently failed to sterilise and in one case as many as eight injections totalling 28·75 grammes had to be given before subinoculations proved the animal to be sterilised. Daubney, after treating bovines infected in Kenya, is doubtful about the effects of the drug and Bevan in Southern Rhodesia states that "the so-called Surfen C, much vaunted as a remedy for *T. congolense* infection elsewhere, has not proved as successful against the local strains of trypanosome."

Van Rensburg describes in detail the very careful experiments which he has carried out upon animals at Onderstepoort. The animals, bovines and ovines, were all artificially infected with various strains of *T. congolense* and were at no time exposed to natural infection. Three different issues of the drug were used. The intramuscular injection of Surfen C in the doses recommended was not followed by any general symptoms. The quantities given as a dose and the intervals between the doses varied. The results are set down in two tables and the conclusions arrived at are that the intramuscular injection of Surfen C in the treatment of *T. congolense* infection in bovines and ovines was found to be ineffective, and that the intramuscular injections of Surfen C into bovines caused serious local reactions.

L. E. W. B.

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[THE EFFECT OF CARBON TETRACHLORIDE ON THE LIVER OF THE PIG, WITH SPECIAL REFERENCE TO EXPERIMENTAL CIRRHOSIS. White, E. G. (1939.) *J. Path. Bact.* **49.** 95-103.]

In pigs weighing 7 to 17 kg. the subcutaneous injection of a single dose of carbon tetrachloride of 0·6 c.c. per kg. body weight seldom caused clinical symptoms although autopsy reveals necrosis of the central half or almost all the liver lobules. Repair is complete at the end of a week and the liver has by this time returned to normal. The histological changes seen in animals killed at varying intervals after a single dose are described.

Repeated subcutaneous injections of the drug at four- to five-day intervals lead to cirrhosis characterised by the subdivision of the liver lobules into small groups of liver cells ("pseudo-lobules") by collagen and reticulum fibres. The pathogenesis of the process was studied by examining small portions of the liver removed at intervals and finally by carrying out an autopsy. The most severe degree of cirrhosis resulted from the largest dose—36 injections of 0·2 c.c. kg. body weight of the drug. There was no ascites, icterus nor splenomegaly.

The experimentally produced cirrhosis was similar to that occurring naturally in the pig.

E. G. W.

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[SOME OBSERVATIONS ON THE LIVER OF THE PIG: THE HEPATIC LOBULE AND LIVER CELL DURING POST-NATAL GROWTH. White, E. G. (1939.) *J. Anat.* **73.** 365-386.]

Using stained histological sections, measurements of the mean area of cross section and diameter of the hepatic lobule were made. A total of 35 estimations was carried out on 26 pigs (several samples removed at intervals by operation from some animals), varying in age from five to 297 days and liver weight from 30 to 2,650 grammes. The smallest lobule diameter was 0·37 mm., the largest was 1·60 mm. From the area of cross section of the lobule, assuming a theoretical shape, the total number of liver lobules was calculated; the number varied from 210,000 to 790,000, the mean being 450,000. These results agreed well with direct observations carried out by counting the liver lobules in weighed amounts of liver tissue macerated in hydrochloric acid: by this method the number of lobules varied from 250,000 to 750,000, the mean being 490,000.

No increase in the number of lobules could be demonstrated later than five to seven days after birth, this being the earliest age at which either method of estimation could be employed. It is concluded that the lobules increase in size and not in number. Mitoses are frequent in the liver cells of pigs between one and seven days old; they are rare in adult pigs.

Various estimations were carried out on the size of the liver cells and nuclei in pigs of varying age. The number of binucleate liver cells increased from 1·34 per cent. in the new-born pig to 11·0 per cent. in the adult.

E. G. W.

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[THE INHERITANCE OF CRYPTORCHIDISM IN DOGS. Hartl, J. (1938.) *Kleintier und Pelztier.* **14.** 45.]

The incidence of cryptorchidism in dogs, especially "Boxers," in Germany has recently risen considerably. The author carried out an investigation on the incidence of the condition in this breed at the instigation of various breeders. From his study of the pedigrees of 55 litters in which cryptorchidism occurred and 28 normal litters, he concludes that it is inherited as a simple recessive character. Its high incidence can be traced to the use of a few particular animals which have played a prominent part in the development of the breed.

Measures suggested for the reduction of its incidence comprise the rigid exclusion from stud of affected animals and those with a history of cryptorchidism in their pedigree.

E. G. W.

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[EQUINE DEGENERATIVE ARTHRITIS. Kelser, R. A. and Callender, G. R. (1938.) *Vet. Med.* **33.** 307-320. (18 refs. 23 illust.).]

The authors give a detailed account of investigations in a degenerative arthritis attacking a very high percentage of horses and mules in sections of the American army. The condition, which was manifested by "shifting" lameness, spavins, ringbones, etc.,

while occasionally there was a slight thickening of the mandibles, was thought to be a type of osteomalacia. It was noted on *post-mortem* examination that few cases showed gross pathological change of the bone, the characteristic lesion being extensive involvement of cartilages out of proportion to the severity of lameness and suggesting absence of symptoms until the subchondral bone is involved. After reviewing the data on osteomalacia it was decided that there was no evidence suggesting that the condition was osteomalacia, but rather that it was a degenerative arthritis.

There was revealed, however, a certain similarity in the pathological changes to those described as occurring in so-called "rheumatic diseases." A satisfactory answer as to whether the joint changes were associated with osteomalacia being of great importance to the authorities, an extensive study of the subject was undertaken, paying particular attention to the contrasting histopathology of osteomalacia and degenerative arthritis.

Osteomalacia is essentially a process of decalcification and absorption of the normal bone and its replacement by masses of soft osteoid tissue. It is now definitely established to be associated with a disturbance of mineral balance, though the precise mechanism is not fully understood. Some consider endocrine misfunction to be involved, others think that avitaminosis is an important factor, while it has been claimed as proven that a calcium-phosphorus ratio outside the limits of 1 : 1 and 1 : 1·8 will cause the condition. The bones become abnormally light and in advanced cases may be cut with a knife, revealing a greyish surface streaked red and yellow. Histologically there is a replacement of the dense bone of the cortex and cancellous central portion by fibrous and osteoid tissue revealed by staining as poor in calcium. Remnants of bone undergoing absorption are seen near the periosteum; typical marrow is rare or absent. The new tissue is highly vascular and laid down in trabeculae like cancellous bone, but more abundantly, which causes the increased bulk.

In degenerative arthritis the bones are of normal weight and density, and the lesions are essentially cartilaginous, consisting of a non-inflammatory arthropathy, bone involvement occurring secondarily in advanced cases. Grossly, the mildest lesions are grooves and "blisters," primarily involving the peripheral layers of cartilage covering the ends of bones. The grooves are roughly parallel, and in the direction of the motion of the joint, and in the depths, a reddish colour may indicate the underlying vascular bone. Microscopically, the grooves are revealed as depressions in the cartilage, the lining membrane being swollen and hyaline, and lost in some places. The margins appear oedematous, and with the cell nuclei widely separated. Where clefts have spread into the depth of underlying bone the normal alignment of the cells is upset and groups of nuclei suggest cell proliferation without subsequent splitting. "Blister" formation appears somewhat more common than grooving, beginning as small elevations on the surface of the cartilage, and later rupturing so that the peripheral layers appear as projecting fingers which may coalesce. If rupture does not occur shallow pits are formed, covered by partly hypertrophied fibrocartilage continuous with the normal tissue. Below the surface the nuclear structure is seen to be disturbed. Early stages show a central irregular space bounded by fibrillated cartilage and surrounded by a zone with widely separated cells. It appears that the primary condition is a focal oedema, the subsequent rupture leading to the formation of a villous ulcer which gives the finger appearance. The areas may coalesce and friction may set up the condition on the opposing surface. Clefts running into the bone occur as in the groove type, and surface necrosis appears as the disease progresses.

The histopathology described suggests that the condition is a deficiency disease in which a disturbance occurs in the nutrition of the articular cartilages, without necessarily involving other tissues. It may be that a mineral deficiency, avitamosis, or a combination of these is the determining factor. The change is of a non-inflammatory nature and is apparently non-bacterial in origin. A marked similarity is noted between the joint diseases studied in Equidae and human degenerative arthritis.

A. E. K.

REPORT

[**NIGERIA.** Report of the Veterinary Department, 1938.]

On instructions from Government this report has had to be curtailed to a summary of the year's working, consequently much of the interesting and valuable information which used to be a feature of this Department's reports in the past is now missing. We hope this restriction will not be continued indefinitely. Annual reports from the various Colonies are eagerly read by our colleagues throughout the Colonial Service and do incalculable good by disseminating knowledge of mutual interest, especially since there is usually no other source of first-hand information made available to them. Despite this restriction, however, the present report contains enough data to signify the extent of the arduous work undertaken during the year. As an index of this, 630,913 cattle were immunised against rinderpest, 561,717 against black-quarter, 195,525 against pleuro-pneumonia, 51,385 against anthrax, and 29,567 against haemorrhagic septicaemia. Furthermore, 11,088 cattle received a curative course of treatment for trypanosomiasis.

The major diseases of animals in Nigeria are rinderpest, trypanosomiasis, pleuro-pneumonia, black-quarter, anthrax, haemorrhagic septicaemia, helminthiasis, rabies and certain diseases of goats. Rinderpest is now under control, thanks to the policy of the Department during the past 15 years of actively immunising as many animals by the sero-virus method as the available facilities allowed. The position in regard to trypanosomiasis is not so satisfactory as could only be expected owing to widespread tsetse belts. These belts are now better defined and the incidence of the disease in the cattle herds has been reduced greatly by warning owners against the danger of taking their animals into infested areas. Vaccination of in-contact animals seems to be giving good results in the case of pleuro-pneumonia. It is stated that recent tests carried out at the laboratory showed that the vaccine employed produces a definite immunity lasting for at least one year. Large-scale vaccination against black-quarter and anthrax have effectively kept

these diseases in control. The prompt vaccination of all herds in an infected area against haemorrhagic septicaemia appeared to give an immediate and effective protection to the animals but the immunity so conferred was of short duration (about two months).

In addition to disease control the field staff of the Department conduct free clinics throughout the country for the treatment of sporadic complaints of animals. This work is very praiseworthy since many animals are victims of considerable suffering from harness wounds and other complaints of mismanagement. Animal husbandry and stock improvement schemes are also conducted by the Department both in the field and at the Department's stock farm.

The report of the Pathologist is more extensive than it had been for some years previously, and while the laboratory staff is still small—too small for the work awaiting attention—a certain amount of research was conducted in addition to the preparation of considerable quantities of sera and vaccines for field use. Experiments into the value of vaccine (with formolised spleen pulp) plus serum given simultaneously as a means of conferring a safe immunity to rinderpest showed that the serum blocked out the immunising effect of the vaccine and left the animals fully susceptible three weeks later. Incompleted experiments on the production of premunity in calves to trypanosomiasis show evidence for little encouragement along this line of dealing with the disease. *Tryp. simiae* was identified in the Colony for the first time and it killed pigs with dramatic suddenness. The intravenous inoculation of pleuro-pneumonia virus in agar emboli successfully set up the lesions of the disease in the lungs and pleurae. This means is now adopted to test immunity following vaccination.

Investigations were made into the poisonous property of several plants found in pastures and five plants were found to be fatally toxic for cattle. There is little doubt that plant poisoning is responsible for a high death rate in the animals of the country.

A systematic collection and identification of the metazoan parasites of the Colony was begun and a list is promised in a future report. W. K.

In Parliament

COLONIAL DEVELOPMENT AND WELFARE BILL

In the House of Lords on Tuesday last the Colonial Development and Welfare Bill, which has passed through the Commons, was read a second time.

In moving, LORD LLOYD, Secretary of State for the Colonies, said that much that it had been hoped to do under the Bill would have to wait. In present circumstances it was useless to pretend that they could carry on as usual with the Colonial services. But at least the Bill would ensure that such development as was possible was not stopped for lack of funds. In the special case of the West Indies there was less reason to hold up development, and more reason for going ahead with it. Sir Frank Stockdale, the present agricultural adviser to the Colonial Office, had been appointed Controller of Development Welfare for the West Indies, and it was hoped soon to make known the appointment of members of his expert staff. They would be assured that if men and material were available from local resources, the money would be made available for the carrying out of urgent schemes.

In a tribute to the magnificent response of the Colonial Empire to the war effort, Lord Lloyd said that more important even than the contributions in money, manpower, and munitions was the spirit which animated the whole of our Colonial Empire.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

July 8th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

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Evacuation of Children to Canada

Ontario Veterinary Association's Offer of Co-operation

At the meeting of Council, N.V.M.A., held at Edinburgh on Tuesday last, the receipt was reported of the following cablegram transmitted to the Association by the Secretary of the Royal College of Veterinary Surgeons, to whom it was addressed, from the Ontario Veterinary Association: —

612, King Street West,
Hamilton,
Ontario.

"Members of Ontario Veterinary Association desire you to convey to veterinarians in Great Britain, those contemplating evacuating their children to Canada, that we wish to assist individually and collectively caring for these children. Those desiring to move children to Canada for duration of war, please contact us immediately. Will then arrange with Dominion Commission in placing children in suitable home environment.

Sincerely,

J. E. JOHNSTON, *President.*

W. J. RUMNEY, *Secretary-Treasurer.*"

The Council was deeply appreciative of this generous offer, and requested the officers of the Association to take energetic steps to prosecute enquiries as to the best means of complying with this invitation. Will members interested please communicate immediately with the General Secretary, N.V.M.A., 36, Gordon Square, even if they have already taken steps concerning the evacuation of their children.

We are certain that in transmitting the following cable the President is voicing the gratitude of all our members to the Ontario Veterinary Association for the kindly thought which prompted this token of friendship.

"The Council of the National Veterinary Medical Association assembled in Edinburgh received with very deep appreciation your most generous offer *re* the evacuation of school children. This is being transmitted to the profession and the Association will communicate with you again when its enquiries are completed. Please convey our heartfelt thanks to your members.

Gratefully yours,

J. HOLROYD, *President, Royal College of Veterinary Surgeons.*

H. W. STEELE-BODGER, *President, National Veterinary Medical Association,* 36, Gordon Square, London."

National A.R.P. for Animals Committee

The grouping of certain counties under the supervision of Area Veterinary Controllers continues, with the object of facilitating the prosecution of the Rural Areas Scheme in full co-operation with branches of the National Farmers' Union and the Ministry of Food's Local Representatives. Since the committee's last announcement the list of Area Veterinary Controllers has been augmented by the acceptance by Mr. Alexander Ratter (Liverpool) of the Controllership of the Lancashire and Cheshire area.

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PETROL SUPPLIES, EASTERN AREA

The Divisional Petroleum Offices at Chelmsford and Cambridge have been closed. All communications which were previously addressed to either of those offices should now be sent to: Divisional Officer, " Dalberg," Chaucer Road, Cambridge.

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LIVESTOCK CASUALTIES THROUGH AIR ATTACK

Salvage of Carcases

The co-operative nature of the development of the Government scheme for dealing with casualties amongst farm stock is emphasised in the following announcement by the Ministry of Food:—

In view of the risk of animals being killed or seriously injured by enemy action, stock owners are reminded that, unless animals are bled and disembowelled immediately after being killed, the meat is not likely to be passed as fit for human consumption. In cases, therefore, where animals have been killed by enemy action, the owner should have them bled and disembowelled as quickly as possible. Where it is necessary for an animal which has been injured to be killed without delay, the owner should, if unable to secure the services of a local butcher, take steps himself to kill, bleed and disembowel it.

In conjunction with the National Air Raid Precautions for Animals Committee (N.A.R.P.A.C.), the Area Meat and Live Stock Officers of the Ministry of Food have made arrangements for salvaging meat from animals where a substantial number may have to be slaughtered on farms in an emergency. Details of these arrangements vary in different areas, and stock owners should get into touch with the local secretary of the National Farmers' Union or with the local N.A.R.P.A.C. organisation to find out what to do in order to take advantage of the arrangements.

If the carcases appear to be fit for human consumption, it will be necessary for the farmer to arrange for the dressed carcases, together with the hide and offals, to be taken to the nearest Government slaughterhouse and to inform the local district chairman of auctioneers. Payment for animals will then be made by the Ministry of Food on the same terms as under existing arrangements for casualties. The decision whether the meat is fit for human consumption will depend upon the result of its examination when it reaches an authorised slaughterhouse.

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PARASITIC DISEASES OF ANIMALS TRANSMISSIBLE TO MAN

The Welsh Outbreaks of Trichinosis and Hydatid Disease

During the past few years Public Health Authorities of South Wales have been alarmed at the comparative incidence of trichinosis and hydatid disease in man. Information received from the Welsh Board of Health indicates the prevalence of trichinosis in West Wales and a number of cases have been definitely diagnosed in human beings in Pembrokeshire.

The train of symptoms in human beings produced by the muscular form of *Trichina* so much simulates muscular rheumatism that we wonder how many cases of true trichinosis are wrongly diagnosed and so unrecorded. Three patients are at the moment under treatment for trichinosis in two Cardiff hospitals.

As will be noted from the report reproduced elsewhere in this issue, the prevalence of hydatid disease in Wales has been exposed by the investigations of Dr. Nancy Howell of the Welsh Board of Health consequent upon the operative findings of Mr. Lambert Rogers, Professor of Surgery at the Welsh National School of Medicine. Records show that 144 cases of hydatid disease, involving 30 deaths, were admitted to hospital during the period 1927-1936.

Even Liverpool and Chester hospitals record cases received from Wales. It is impossible to assess the extent of infestation in human beings because *post-mortem* examination is not a routine practice, but we are told that the cyst is not uncommon on *post-mortem* examination in individuals who showed no apparent symptoms. It is also noted that the incidence of hydatid disease is greater in industrial areas.

Members of the profession will realise the serious Public Health problems these diseases present. The life cycle of the respective causal parasites can be broken in the slaughterhouse by efficient meat inspection carried out under veterinary control.

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R.C.V.S. OBITUARY

WALKER, Joseph, The Elms, Anstey Road, Alton, Hants. Graduated London, April 1st, 1884. Died June 26th, 1940; aged 88 years.

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PERSONAL

Mr. W. L. Wilson, M.R.C.V.S., of the Ministry of Agriculture's Veterinary Laboratory, New Haw, Weybridge, has now been re-transferred to the Ministry's Field Staff.

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LEGAL NOTES

Verbal Warranty of a Cow.—Interpretation of the words " right and straight " used by an auctioneer while selling a milking cow at Launceston Market on December 12th last was argued at Launceston County Court recently, when Mrs. Alice Maude Pridham, of Redgate, Callington, made a claim against Leonard Thomas Kneebone, farmer, of Lifton, for damages for breach of warranty on the sale of a milking cow and calf at the price of £25 15s.

Plaintiff's solicitor (Mr. W. L. Broad) stated that the auctioneer described the cow as " honest and reliable "; it was eventually knocked down to Mrs. Pridham at £25 15s. During the proceedings, defendant, it was alleged, said the cow was " right and straight." The cow was taken to Redgate and plaintiff found that the cow refused to eat. There was something definitely wrong with it. She went to see the animal during the night and found it was discharging badly. Next day it was turned out into the field and was seen to be getting worse. Plaintiff gave the cow every attention, but it did not improve. On December 30th the cow was examined by Mr. Hugh Fraser, veterinary surgeon, Tavistock, who gave a certificate that the cow was suffering from Johne's disease and in which he expressed the opinion that the cow was so affected on the date of the sale. The cow did not give a drop of milk after the date on which it was purchased.

Plaintiff and Mr. Fraser having given evidence accordingly, the defendant stated that he did not know there was anything the matter with the cow at the time he sold it. The cow had calved ten days previous to the sale. The auctioneer asked if the cow was all right in its four milking quarters, and witness replied " Yes." Apart from that the auctioneer did not say any more to him during the sale. He sold about 12 cows a year and did not give

any warranty as to their general condition. He valued the calf, a South Devon, at £4 5s.

Cross-examined by Mr. Broad, defendant said he could not account for the fact that the cow gave no milk on the day of the sale. Neither could he understand why plaintiff had waited a week before making a complaint.

Mr. R. M. B. Parnall (representing the defendant) submitted that the warranty had not been proved. It was a question of representation, and an innocent misrepresentation carried no right to sue for damages.

His Honour Judge Lias, reviewing the case, pointed out that the only witness who could have been quite certain about the warranty was the auctioneer, but neither plaintiff nor defendant had called him. Defendant, whose evidence he considered was unsatisfactory, had called a "family party." He found without any hesitation that anyone listening knew the meaning implied by the words "right and straight." If it could be proved that it was stated verbally at a public auction, then the vendor could not get away from the warranty, without proving that everybody at the auction knew it meant something different from that which it had been generally taken to mean.

His Honour made an award to plaintiff of £29 15s. and costs, having valued the calf at £2 5s., and also made allowance for the carcase of the cow.

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FEEDING STUFFS FOR POULTRY

Immediate Drastic Flock Reduction Not Necessary

The Minister of Agriculture, in his broadcast to farmers on June 2nd, explained the position with regard to imports of feeding stuffs for animals and warned producers that the supplies available for pigs and poultry by mid-autumn are likely to be very limited indeed. He urged strongly that hatching should be curtailed at once since poultry keepers who depend entirely upon purchased feeding stuffs must proceed on the assumption that their poultry stocks may have to be reduced to one-third of their present numbers by mid-autumn. The Ministry of Agriculture and the Department of Agriculture for Scotland have issued the following further advice to farmers and poultry keepers in Great Britain.

It should be emphasised that there is no cause whatever for immediate drastic action or for a rush to sell birds. The reduction should be made in an orderly manner. There is every reason to hope that sufficient feeding stuffs will be available to rear to the killing or to the laying stage those chickens already hatched, if from now onwards poultry keepers carry out rigorously the culling of existing flocks.

So far as can be foreseen at present the quantities of feeding stuffs released for the poultry industry during the next few months will be reduced to the following percentage proportions of the estimated total normal average requirements of poultry during the summer months, *viz.*: July, 60; August, 55; September, 40; October, 33.

These figures include home produced as well as imported feeding stuffs. It must be clearly understood, however, that conditions may make it impossible to keep to this programme, which must be regarded as a maximum. There will be a similar decrease in the quantity of feeding stuffs released for consumption by pigs. These reductions can only be achieved gradually in the manner proposed if dairy cows, and especially beef cattle and sheep, are fed to a much greater extent than usual upon grass and green fodder crops during the summer and early autumn. In the common interest, owners of dairy cows, beef cattle and sheep are urged to reduce to a minimum the use of cereals and concentrates so as to facilitate the orderly reduction in numbers of pigs and poultry and to lessen the hardship that might arise from premature and hasty disposal of such stock. It cannot be too strongly impressed upon those responsible for the management of dairy and beef cattle herds and sheep stocks that the utilisation to the best advantage of the country's livestock resources depends in large measure on the patriotic action they take in conserving the limited supplies of feeding stuffs.

Turning again to poultry, in addition to the cessation of hatching and the disposal of table chickens as soon as they are saleable without any intensive fattening, the normal culling of poultry flocks should be accelerated and pursued rigorously. All unproductive, unhealthy and old birds should be disposed of at the earliest opportunity. It is not only against the national interest to continue using feeding stuffs for such birds but it is also unfair to other poultry keepers possessing healthy and productive birds who may thus be deprived of some of the feeding stuffs they need.

Considerable numbers of young pullets are being reared now and in most instances it will be desirable, so far as practicable after suitable culling, to retain these birds for laying next autumn and winter, though this may involve the disposal of more yearling hens than usual at the end of the summer. These hens should be culled as soon as their production becomes negligible—except possibly in the case of late moulters which continue to lay right into the moult, especially if they have been laying well during most of their pullet year. Every effort should be made to retain at least a nucleus of the best breeding stock.

Owners of young turkeys should get their birds on to open range as soon as practicable. Only a small proportion of the purchased feeding stuffs normally used for fattening their turkeys for the Christmas market will be available.

Meanwhile, poultry keepers should explore every possibility of getting their birds on to open range where natural foods may be available for poultry. It may be possible in many instances for mutually advantageous arrangements to be made with general farmers. In other cases waste materials of various kinds and suitable when properly handled for feeding to poultry, may be available as substitutes for grain and meal; poultry keepers should also make every practicable effort to grow food for their birds.

* * * * *

MINISTRY OF AGRICULTURE NEWS SERVICE

Tripod Method for Hay Drying.—The great difference in feeding value between good and poor hay is sometimes overlooked. But next winter farmers will need every extra ounce of feeding value that careful handling of the hay this summer can give. Their attention is therefore drawn to the great merits of the tripod method of harvesting. Wilted green stuff will dry out of these tripods and retain its green colour and feeding quality. If grass or any green forage crop is cut one day, it can be tedded forthwith and corked up in tripods next day, after which it is practically secure from the weather. These advantages are particularly great in Wales and Northern and Western Districts of England. Tripods can also be recommended for use in harvesting not only hay, but the even more easily spoiled forage crops, and are also valuable in harvesting crops for seed.

. . . . . .

Whey for Pigs.—All forms of edible waste must be put to fullest use now that a further drastic cut in feeding stuffs, particularly for pigs and poultry, is in prospect. Whey is one of the by-products that could be used more extensively. It is not so nutritious as skimmed milk, but it has a useful value for feeding to pigs. It is rich in milk sugar (lactose), and it contains most of the mineral salts of milk, such as calcium, which are particularly valuable and not easily obtainable in other feeding stuffs.

When given to pigs, it should be as fresh as possible. As much as 2½ gallons per head per day may be fed. Whey is available in large quantities at this time of the year at many cheese-making creameries. Pig keepers within easy reach of these should make every effort to arrange supplies for their pigs and creamery managers will be doing a national service by getting whey that would otherwise be wasted back to the farms where it can be used.

. . . . . .

Pea Haulms for Winter Keep: Pods and Bines Make Good Silage.—The opportunity to make silage from pea by-products during the next month or two should not be missed. Both the empty pods and the bines are rich in protein and minerals, and so long as the material is

collected when it is still comparatively fresh and green it can be made into a palatable and nutritious winter food.

Where the peas are picked early or are grown for canning, the pods and bines are well worth ensiling in a container. If properly made, the silage is almost as nutritious as pasture grass and can be used for meat and milk production, 25 lb. of the silage, along with the usual ration of hay, being sufficient for one gallon of milk. There are no special difficulties in making this silage and molasses need not be added. Bines from picked peas will need careful teasing out during filling, and treading must be firm and thorough; but crops that have passed through a bining machine and are thoroughly bruised in consequence pack readily without chaffing. A succession of canning crops should be ready from the end of June onwards and so excellent material for the silo will be available over a considerable period. Where it is factory practice to cart the entire crop to the cannery, growers should make a point of securing their quotas of pods and bines as soon after bining as possible.

Where peas are grown for late picking, the bines are of less feeding value. Nevertheless, a useful roughage can be obtained by making them into stack silage, or, if already half dry, into hay. As soon as picking is over, therefore, the waste should be gathered together and heaped on a level site into a rectangular stack, teasing out each forkful and treading very thoroughly. When the stack is about 12 ft. high, the edge is ringed with sods or sacks half filled with earth, and the top is then covered over with 9 in. of soil. The resultant silage is relished by cattle and should be used as a maintenance ration, feeding about 3 lb. of the silage to replace 1 lb. of hay. It also makes a good food for sheep, producing rapid growth and first quality mutton. Dry bines, it should be noted, are useless for ensiling, even by the stack method, though they may be fed as hay if carefully preserved.

* * * * *

CEREALS AND RICKETS

"It is now nearly 20 years ago that Mellanby showed* that cereals may produce rickets in young animals; increasing the cereals in diets deficient in the antirachitic vitamin intensified the symptoms of rickets," stated the *Lancet* recently. "The explanation then suggested that cereals speeded up the growth of the animals without at the same time supplying sufficient calcium and phosphorus for the bones has since been found inadequate, although possessing some validity. On the whole, the cereals with the largest content of Ca and P, such as oatmeal, maize and wheat-germ, cause the lowest retention of these elements in the bones and teeth. A large part of the organic phosphorus of cereals, as of seeds in general, is in the form of phytic (inositolhexaphosphoric) acid in combination with calcium and magnesium. Phytin itself is not absorbed in the alimentary canal, its utilisation being due to breakdown into inositol and phosphoric acid from bacterial action in the intestine. Hot dilute acids have similar effect, a significant fact in view of the reduced rachitic action of cereals which have been boiled with acid. Harrison and Mellanby have tried† the effect of feeding phytic acid and its crystalline alkaline salt to dogs. Both were highly rachitogenic when added to a borderline diet, the action being roughly comparable to that of oatmeal of similar phytin content. The rachitogenic action of sodium phytate, as of cereals, is antagonised by adding extra calcium to the diet. Commercial phytin itself is slightly antirachitic. The amount of phytic acid in oatmeal is about twice that needed to precipitate the calcium in the cereal. On the other hand, Palmer and Mottram‡ trace the tendency of cereals to produce rickets to their lower calcium and high phosphorus content. This tendency can, they find, be counteracted entirely by adding calcium lactate to the diet so as to make the Ca : P ratio 1 : 0·5, and they conclude that the rachitogenic action of cereals does not reside in the phytin they contain, for the reason that the addition of phytin actually reduces the rickets. The first of these conclusions is consistent with the facts put forth by Harrison and Mellanby; the other may be explained by the fact that the commercial brand of phytin used by both groups of workers was found by Harrison and Mellanby to have a Ca : P ratio of 1 : 1·8 while the phytin prepared from oatmeal gave a ratio of 1 : 3, with a Ca : Mg ratio of 1 : 1·5 against 1 : 0·125 in the commercial preparation. Harrison and Mellanby draw from their work the practical conclusion that the rickets-producing action of cereals is to be overcome, not by increasing the P of the diet (as would hold if it were true that the cereal action is due to unavailable P), but by increasing the Ca intake—*e.g.*, by drinking more milk. It seems likely, in fact, that the rachitogenic action of cereals only comes into effect in diets on or below the borderline of necessary Ca and vitamin D. It is unfortunate that, for economic reasons, these borderline diets so often contain a disproportionately high amount of cereal."

* Mellanby, E., *Lancet*. (1930.) 1. 1290.
† Harrison, D. C., and Mellanby, *Biochem. J.* (1939.) 33. 1660.
‡ Palmer, N., and Mottram, J. C., *Ibid.* p. 512.

* * * * *

CLARIFYING THE PITUITARY

Having in mind the great importance assumed by hormone therapy in veterinary therapeutics in very recent years, the following leading article from the *British Medical Journal* is reproduced inasmuch as it focuses critically the position regarding our present knowledge of the manifold functions of the hormones of the pituitary gland.

"Dr. H. B. van Dyke's second volume on the physiology and pharmacology of the pituitary body[1] is in effect a critical digest of the experimental literature which has appeared since the publication of the first volume in 1935. The need for such a guide is shown by the fact that approximately 750 articles appear annually on the subject. It might be alleged that the quantity is more conspicuous than the quality, but it would be fairer to describe the present phase as one of consolidating in detail the advances previously made. Nevertheless, some notable advances have been made in clarifying certain aspects of the complex functions of this organ. Dr. van Dyke's provision of a brief summary of his opinion on recent work at the end of each chapter is most helpful in enabling the reader to assess such advances. On the anatomical side he calls attention to the fact that the complex blood supply of the pituitary includes a portal system to the glandular part. He thinks that there is little basis for postulating any chemical influence of pituitary hormones on the diencephalon, but ample evidence of nervous influences operating in the reverse direction, of which the release of gonadotrophic hormones through nervous action is an outstanding example. In this connection it is of great interest to learn that in birds and certain mammals stimulation of the optic nerves by light conveys impulses to the diencephalon which influences this release and consequently the date of the mating season. In animals without such seasonal variations such stimuli do not play an evident part. The fact that morphological changes following gonadectomy can be corrected by oestrogenic or androgenic substances affords experimental support for the clinical use of the former at the climacteric. In human beings the chorionic villi of the placenta produce enormous quantities of luteinising hormone until gestation is complete or the foetus dies. Chorion epithelioma and hydatidiform mole produce a hormone chemically identical with that of normal pregnancy. The complex nature of the influence of pituitary hormones on lactation is shown by the failure of injection of lactogenic hormone to initiate lactation after ablation of the pituitary. It is a point of

1. *The Physiology and Pharmacology of the Pituitary Body.* Volume II. By H. B. van Dyke. London: Cambridge University Press. 22s. 6d. Chicago: University of Chicago Press. 4.50 dollars.

considerable biological interest to find that this hormone can be assayed by its stimulating effect on the growth of the pigeon's crop glands, showing the close homology between them and the mammary glands.

"Turning to the association between the adrenals and the pituitary, it appears that the morphological and functional maintenance of the cortex of the former, including the sex-determined 'X zone,' depends on secretions from the latter; the adrenotrophic anterior pituitary hormone also seems to play a part in the metabolism of fat, causing fat to be transported from the tissue depots to the liver. This is curious, since it has been known for some years that the posterior pituitary secretion, pitressin, has a similar action. Our knowledge of the rôle of anterior pituitary hormone in carbohydrate metabolism continues to grow, and the antagonism between it and insulin is now well established. In the absence of the latter the former exhausts carbohydrate reserves and leads to dangerous ketosis. Yet on the other hand the anterior pituitary appears to be necessary for the normal absorption of dextrose from the alimentary tract. We are indeed reaching the point at which the pituitary appears to intervene at every phase of metabolism throughout the body, justifying its description as the master gland. It is increasingly clear that it may also be described as the central transformer of nervous into chemical energy, just as the nerve endings are the site of a similar transformation at the periphery."

* * * * *

A national scheme for the identification of cattle by ear-marking to be carried out through the milk recording movement was suggested by Mr. James Mackintosh at a meeting of the Central Council of Milk Recording Societies in London. Mr. Mackintosh said that under the Ministry of Agriculture's graded milk schemes no uniform system of marking was required. There was need for one national system for the identification of cattle: could not the milk recording movement be so enlarged that it became the national system?

* * * * *

Dr. E. S. Russell, O.B.E., Director of Fishing Investigations, Ministry of Agriculture and Fisheries since 1921, has been elected President of the Linnean Society of London for 1940-41.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

* * * * *

The Extended National A.R.P. for Animals Committee Service

URGENCY OF FULL PROFESSIONAL ENROLMENT

TO THE EDITOR OF THE VETERINARY RECORD

SIR,—I would like to take advantage of the hospitality of your columns to send a few words to my colleagues.

Some few days before the declaration of war, a committee consisting of representatives of the Home Office, Police, Ministry of Agriculture, Animal Welfare Societies and Members of our Profession, was set up under the aegis of the Ministry of Home Defence and designated "The National A.R.P. for Animals Committee."

To this Committee, the Lord Privy Seal appointed Mr. H. E. Dale, C. B., as Chairman.

The primary object of the Committee was to institute measures for the prevention and alleviation of animal suffering and the protection of human beings from panic stricken or gas-contaminated animals in those cities and areas of the country considered at that time likely to attract hostile attention.

An appeal was made to the veterinary profession to give that help which only its specific training could render and although no remuneration could be offered, except that of bare out-of-pocket expenses, the answer to the call to this National Service was both prompt and gratifying.

From its inception, the Committee has had the willing and valued support of the profession and the earnest and cordial co-operation of the animal welfare societies and from this happy and effective combination an organisation has been established well fitted to meet any emergency which may arise in the areas hitherto scheduled as vulnerable.

The prosecution of the war, with its sequence of unhappy events, creates however a new and urgent situation, demanding renewed and sustained effort from everyone of us, and we, as veterinary surgeons, are now called upon to serve in that wider sphere which embraces the rural areas and pasture-lands of our Homeland.

It is fortunate that only a few weeks ago, a Committee of the National A.R.P. for Animals Committee was formed to deal with rural areas, and a scheme was promoted to afford the maximum veterinary assistance to animal casualties wherever these may occur. This has been welcomed by farmers throughout the country, endorsed by the National Farmers' Union, and is being developed in close co-operation with the Ministry of Food and the veterinary staff of the Ministry of Agriculture.

Thanks to the energy and zeal of our confrères in many parts of England, there is already an admirable organisation in being, and this has been put to crucial test during the recent frequent bombing raids along our Eastern shores and in the Midlands, in which animal casualties have been dealt with promptly and effectively.

In the immediate future, similar machinery will require to be established over the entire country so that the injured animal will be tended without delay, or, should it be a food animal, its carcase salvaged, to conserve the country's meat supplies.

The National A.R.P. for Animals Committee seeks to establish veterinary supervision over every part of the country, but in order to achieve this aim it will be essential, in view of the meagre numerical strength of our profession, that every veterinary surgeon be enrolled, and I most earnestly exhort my colleagues, who have not so far joined our ranks, to come forward and give their services to the State at this most critical time in the history of our country.

Just as citizens are now called upon to serve in the Local Defence organisation, so we as veterinary surgeons become custodians of the livestock upon which must largely depend our food supplies.

I wish to take this opportunity to express my appreciation and thanks to my colleagues for the generous support and co-operation which they are rendering my committee.

The profession's liberal contribution to its efforts has proved of great encouragement and in full confidence that our honourable profession will continue to play its part in this all-important branch of national service we face with courage the sterner task which now lies before us.

Yours faithfully,
ROBERT J. STORDY,
Chief Executive Officer,

National A.R.P. for Animals Committee,
36, Gordon Square, W.C.1.

June 25th, 1940.

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President, Royal College of Veterinary Surgeons, 1940-1941.